

Self-Deploying Gossamer Support Structure, Phase II

Completed Technology Project (2005 - 2007)



Project Introduction

Phase I results demonstrated the feasibility of using shape memory polymer composites to deploy, tension and support gossamer antennas. Cornerstone Research Group, Inc. (CRG) has completed the critical initial development steps for a deployable support structure meeting NASA's requirements for a structure to deploy, tension, and support gossamer antennas. CRG proposes to further develop this lightweight, self-deploying Veritex

TM

strut for use as a supporting structure for gossamer antennas. Veritex

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composites are similar to other high-performance composites, except that CRG's shape memory polymer (SMP) resin, Veriflex

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, is used as the matrix resin. This allows for easy manipulation of the composite above the activation temperature, making it a unique material for use in dynamic structures and other applications requiring both load strength and "shape-shifting" modulus flexibility. In this Phase I program, CRG has developed and evaluated materials and related fabrication technologies based on Veritex

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, and produced a sub-scale working proto-type. This technical approach fulfills NASA's requirement for a very large, lightweight, on-orbit deployable RF antenna aperture structure by offering a practical, deployable, structural support that will address the short comings of current rigidified inflatables and mechanically deployed structures.



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

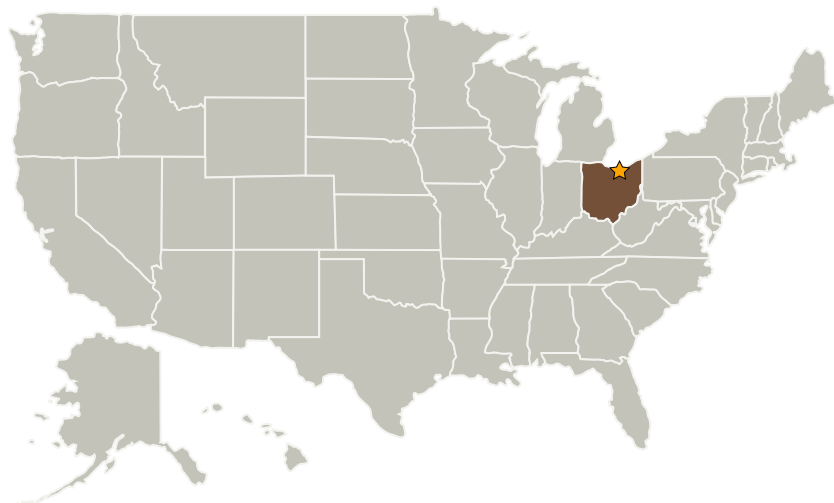
Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Cornerstone Research Group, Inc.	Supporting Organization	Industry	Miamisburg, Ohio

Primary U.S. Work Locations

Ohio

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.1 Materials
 - └ TX12.1.3 Flexible Material Systems